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EXAMINER

LI, SHI K

ART UNIT PAPER NUMBER

2633

DATE MAILED: 06/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/648,847

Applicant(s)

MAYS, ROBERT

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2000 and 19 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 and 16-20 is/are rejected.
- 7) ☒ Claim(s) 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. FIG. 1 and FIG. 9 are objected to under 37 CFR 1.84(o) because there are no descriptive legends for the boxes. For example, it is suggested that the legend "optical detector" be added to the box 14 in FIG. 1. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 15 is objected to because of the following informalities: the phrase "first and array" in line 2 of the claim may contain a typo. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 6-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 1 recites the limitation "the optical element" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim. Similarly, claims 6-10 refer to "the optical element" in lines 1-2 of the claims.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

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improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1 and 3-5 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3-5 of U.S. Patent No. 6,452,700 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other as indicated by the following table.

Limitations of claim 1	Patent 6,452,700 B1
An optical communication system comprising:	1. A backplane interconnect system comprising: (The backplane interconnect system uses optical carrier for communication, therefore it is an optical communication system.)
a source of optical energy to propagate optical	... said expansion card having a source of

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energy along an optical path;	optical energy to propagate optical energy along an optical path;
a detector positioned in the optical path;	a detector positioned in the optical path; and
an optical system having an arcuate surface and a holographic transform function, with the optical element being disposed to filter the optical energy in accordance with properties of the holographic transform function to remove optical energy having unwanted characteristics, defining transformed optical energy, and refract the transformed energy in accordance with properties of the spherical surface to impinge upon the detector.	a holographic optical element having an arcuate surface and a holographic transform function, with said optical element being disposed to filter the optical energy in accordance with properties of the holographic transform function to remove optical energy having unwanted characteristics, defining transformed optical energy, and refract the transformed energy in accordance with properties of said arcuate surface to impinge upon said detector.

Limitations of claim 3	Patent 6,452,700 B1
The system as recited in claim 1 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the optical system includes an array of lenses, each of which is disposed in one of the plurality of axes and includes the arcuate surface with the holographic transform being disposed within a volume of	3. The system as recited in claim 1 further including ... said source of optical energy including an array of optical emitters to generate optical energy to propagate along a plurality of axes and said detector including an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes, with said holographic optical element including an array lenses, each of which is disposed in one of the plurality of axes and includes the arcuate surface with the holographic

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the array of lenses.	transform being disposed within a volume of the array of lenses.
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Limitations of claim 4	Patent 6,452,700 B1
The system as recited in claim 1 wherein the source of optical energy includes an array of optical transmitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes and the optical system including a plurality of lenses having the arcuate surface with holographic transform function being disposed within a volume thereof, with the plurality of lenses being arranged in first and second arrays, the first array being disposed between the array of optical transmitters and the array of optical receivers and the second array being disposed between the first array and the optical receivers.	4. The system as recited in claim 1 further including ... said source of optical energy including an array of optical emitters to generate optical energy to propagate along a plurality of axes and the detector includes an array of optical receivers, each of which is positioned to sense optical energy propagating along one of the plurality of optical axes, said holographic optical element including a plurality of lenses having the arcuate surface, with said holographic transform function being disposed within a volume thereof, with said plurality of lenses being arranged in first and second arrays, said first array being disposed between said array of optical emitters and said array of optical receivers and said second array being disposed between said first array and the optical receivers.

Limitations of claim 5	Patent 6,452,700 B1
The system as recited in claim 4 wherein the holographic transform function associated with a subgroup of the lenses of the first array, defining a transfer function, differs	5. The system as recited in claim 4 wherein the holographic transform function associated with a subgroup of the lenses of the first array differs from the holographic transform

from the holographic transform function associated with the remaining lenses of the first array of lenses, and the holographic transform function associated with a subset of the lenses of the second array matches the transfer function.	function associated with the remaining lenses of the first array of lenses, and the holographic transform function associated with a subset of the lenses of the second array matching the transfer function.
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As indicated above, claims 1 and 3-5 in the instant application are broader than the ones in patent '700. In re Van Ornum, 686 F.2d 937, 214 USPQ 761 (CCPA 1982) and In re Goodman, 11 F.3d 1046, 29 USPQ2Q 2010 (Fed. Cir.1993), broad claims in application are rejected as obvious double patenting over previously patented narrow claims. For example, claim 1 of the present invention is the same as claim 1 of the patent except that claim 1 of the patent includes expansion slot and expansion card. Therefore, claim 1 of the instant invention is broader than claim 1 of the patent.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Robertson et al. (U.S. Patent 5,857,042).

Regarding claim 17, Robertson et al. discloses in FIG. 3 an optical communication system comprising an array of optical transmitters 16A-16D, an array of optical receivers 17A-17B, and lenslets 18 and 19 for filtering unwanted optical energy.

Regarding claims 18-20, the transmitters and receivers of FIG. 3 are one-to-one corresponding.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (U.S. Patent 5,857,042) in view of Ash et al. (U.S. Patent 4,057,319) and Hariharan ("Optical Holography: Principles, Techniques and Applications", 2nd Edition by P. Hariharan, Cambridge University Press, 1996, pp. 213-223).

Robertson et al. discloses in FIG. 3 an optical communication system comprising an array of optical transmitters 16A-16D, an array of optical receivers 17A-17B, and lenslets 18 and 19 for filtering unwanted optical energy. The difference between Robertson et al. and the claimed invention is that Robertson et al. does not associate holographic transform function with the lenslets.

Ash et al. teaches in FIG. 2 and FIG. 3 the use of hologram plate to improve the communication between the transmitter and the receiver. One of ordinary skill in the art would have been motivated to combine the teaching of Ash et al. with the optical communication system of Robertson et al. because holographic technique minimizes optical aberrations and eases the tolerance requirement for relative alignment (see col. 5, lines 58-60 of Ash et al.). The use of holographic technique in systems with multiple transmitters and receivers can further

improve the filtering of unwanted signal if the transmitters send optical energy of different wavelengths.

Hariharan teaches that the hologram can be integrated with the lenslets (see Section 13.4 starting on page 220). One of ordinary skill in the art would have been motivated to combine the teaching of Hariharan with the teaching of Ash et al. in the optical communication system of Robertson et al. because integrating the hologram with the lenslets reduces the number of optical elements and simplifies the alignment. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate holograms with the lenslets of the optical communication system of Robertson et al., as taught by Ash et al. and Hariharan, because the holograms minimizes optical aberrations and eases the tolerance requirement.

Regarding claim 2, as taught by Ash et al., phase can be used to differentiate adjacent transmitter-receiver pairs. If transmitters send different wavelengths, wavelength can be used to differentiate unwanted signal from desirable signal.

Regarding claims 3 and 4, Robertson et al. includes first and second arrays of lenses.

Regarding claim 5, in the communication system of Robertson et al., the relationship between the transmitters and the receivers are one-to-one corresponding. Therefore, it is obvious that the transfer functions of the holograms match the transmitters in a one-to-one corresponding manner.

12. Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. (U.S. Patent 5,857,042) in view of Ash et al. (U.S. Patent 4,057,319).

Robertson et al. discloses in FIG. 3 an optical communication system comprising an array of optical transmitters 16A-16D, an array of optical receivers 17A-17B, and lenslets 18 and 19

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for filtering unwanted optical energy. The difference between Robertson et al. and the claimed invention is that Robertson et al. does not associate holographic transform function with the lenslets.

Ash et al. teaches in FIG. 2 and FIG. 3 the use of hologram plate to improve the communication between the transmitter and the receiver. One of ordinary skill in the art would have been motivated to combine the teaching of Ash et al. with the optical communication system of Robertson et al. because holographic technique minimizes optical aberrations and eases the tolerance requirement for relative alignment (see col. 5, lines 58-60 of Ash et al.). The use of holographic technique can further improve the filtering of unwanted signal if the transmitters send optical energy of different wavelengths. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the lenslets with holograms, as taught by Ash et al., in the optical communication system of Robertson et al. because the holograms minimizes optical aberrations and eases the tolerance requirement.

Regarding claim 16, Ash et al. teaches that phase can be used to differentiate adjacent transmitter-receiver pairs. If transmitters send different wavelengths, wavelength can be used to differentiate unwanted signal from desirable signal.

13. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Robertson et al. and Ash et al. as applied to claims 11 and 16 above, and further in view of Hariharan ("Optical Holography: Principles, Techniques and Applications", 2nd Edition by P. Hariharan, Cambridge University Press, 1996, pp. 213-223) and Stewart ("Optical Principles and Technology for Engineers" by J. Stewart, Marcel Dekker, 1996, pp. 45-51 and 79-81).

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Robertson et al. and Ash et al. have been discussed above in regard to claims 11 and 16. The difference between the modified optical communication system of Robertson et al. and Ash et al. and the claimed inventions is that Robertson et al. and Ash et al. do not teach the various shapes and the Fresnel lens. Spherical and cylindrical surfaces are commonly used in optical elements for directing light beams in a certain pattern. Fresnel lens is well known in the art for providing a thin lens with a short focal length and large diameter (see Merriam Webster's Collegiate Dictionary, 10th edition, 1997). In particular, Hariharan teaches that hologram can be integrated on substrate of various geometries (see p.220, last paragraph of Hariharan). Stewart teaches lenses of various shapes and that a Fresnel lens is considerably lighter than the equivalent plano-convex lens because of the reduction of thickness (see p.79 of Stewart). One of ordinary skill in the art would have been motivated to combine the teaching of Hariharan and Stewart with the modified optical communication system of Robertson et al. and Ash et al. because the various shapes of the optical element allow the transmitters and the receivers to be disposed in space with various distances and directions and the use of Fresnel lens technique reduces the thickness and weight of the lens. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use various shape for the lenses, as taught by Stewart and Hariharan, and to apply Fresnel lens technique, as taught by Stewart, in the modified optical communication system of Robertson et al. and Ash et al. because the various shapes of the optical element allow the transmitters and the receivers to be disposed in space with various distances and directions and the use of Fresnel lens technique reduces the thickness and weight of the lens.

Allowable Subject Matter

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14. Claims 6-10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

15. Claim 15 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl
June 12, 2003


JASON CHAN
SUPERVISORY PATENT EXAMINER
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